

SEQUENCE LISTING

<110> C. Frank Bennett
Nicholas M. Dean
Lex M. Cowser

<120> ANTISENSE MODULATION OF INDUCIBLE NITRIC OXIDE SYNTHASE EXPRESSION

<130> PTS-0066

<160> 182

<210> 1

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 1

ttcgtcatcg ctcctcaggg

20

<210> 2

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 2

ttcgtcatcg ctcctcaggg

<210> 3

<211> 4145

<212> DNA

<221> CDS

<222> (207)...(3668)

[illegible]

Glu Leu Leu Pro	Gln Ala Ile Glu Phe Val Asn Gln Tyr Tyr Gly Ser	
140	145	150
ttc aaa gag gca aaa ata gag gaa cat ctg gcc agg gtg gaa gcg gta		713
Phe Lys Glu Ala Lys Ile Glu Glu His Leu Ala Arg Val Glu Ala Val		
155	160	165
aca aag gag ata gaa aca aca gga acc tac caa ctg acg gga gat gag		761
Thr Lys Glu Ile Glu Thr Thr Gly Thr Tyr Gln Leu Thr Gly Asp Glu		
170	175	180
ctc atc ttc gcc acc aag cag gcc tgg cgc aat gcc cca cgc tgc att		809
Leu Ile Phe Ala Thr Lys Gln Ala Trp Arg Asn Ala Pro Arg Cys Ile		
	190	200
ggg agg atc cag tgg tcc aac ctg cag gtc ttc gat gcc cgc agc tgt		857
Gly Arg Ile Gln Trp Ser Asn Leu Gln Val Phe Asp Ala Arg Ser Cys		
	205	210
tcc act gcc cgg gaa atg ttt gaa cac atc tgc aga cac gtg cgt tac		905
Ser Thr Ala Arg Glu Met Phe Glu His Ile Cys Arg His Val Arg Tyr		
	220	230
tcc acc aac aat ggc aac atc agg tgc gcc atc acc gtg ttc ccc cag		953
Ser Thr Asn Asn Gly Asn Ile Arg Ser Ala Ile Thr Val Phe Pro Gln		
	235	245
cgg agt gat ggc aag cac gac ttc cgg gtg tgg aat gct cag ctc atc		1001
Arg Ser Asp Gly Lys His Asp Phe Arg Val Trp Asn Ala Gln Leu Ile		
	250	260
cgc tat gct ggc tac cag atg cca gat ggc agc atc aga ggg gac cct		1049
Arg Tyr Ala Gly Tyr Gln Met Pro Asp Gly Ser Ile Arg Gly Asp Pro		
	270	280
gcc aac gtg gaa ttc act cag ctg tgc atc gac ctg ggc tgg aag ccc		1097
Ala Asn Val Glu Phe Thr Gln Leu Cys Ile Asp Leu Gly Trp Lys Pro		
	285	295
aag tac ggc cgc ttc gat atg atc ccc ctg gtc ctg cag gcc aat ggc		1145
Lys Tyr Gly Arg Phe Asp Val Val Pro Leu Val Leu Gln Ala Asn Gly		

Arg	Asp	Pro	Glu	Leu	Phe	Glu	Ile	Pro	Pro	Asp	Leu	Val	Leu	Glu	Val		
315							320					325					
gcc	atg	gaa	cat	ccc	aaa	tac	gag	tgg	ttt	cgg	gaa	ctg	gag	cta	aag	1241	
Ala	Met	Glu	His	Pro	Lys	Tyr	Glu	Trp	Phe	Arg	Glu	Leu	Glu	Leu	Lys		
330					335					340					345		
tgg	tac	gcc	ctg	cct	gca	gtg	gcc	aac	atg	ctg	ctt	gag	gtg	ggc	ggc	1289	
Trp	Tyr	Ala	Leu	Pro	Ala	Val	Ala	Asn	Met	Leu	Leu	Glu	Val	Gly	Gly		
				350					355					360			
ctg	gag	ttc	cca	ggg	tgc	ccc	ttc	aat	ggc	tgg	tac	atg	ggc	aca	gag	1337	
Leu	Glu	Phe	Pro	Gly	Cys	Pro	Phe	Asn	Gly	Trp	Tyr	Met	Gly	Thr	Glu		
			365					370					375				
atc	gga	gtc	cgg	gac	ttc	tgt	gac	gtc	cag	cgc	tac	aac	atc	ctg	gag	1385	
Ile	Gly	Val	Arg	Asp	Phe	Cys	Asp	Val	Gln	Arg	Tyr	Asn	Ile	Leu	Glu		
		380					385					390					
gaa	gtg	ggc	agg	aga	atg	ggc	ctg	gaa	acg	cac	aag	ctg	gcc	tcg	ctc	1433	
Glu	Val	Gly	Arg	Arg	Met	Gly	Leu	Glu	Thr	His	Lys	Leu	Ala	Ser	Leu		
		395				400					405						
tgg	aaa	gac	cag	gct	gtc	gtt	gag	atc	aac	att	gct	gtg	atc	cat	agt	1481	
Trp	Lys	Asp	Gln	Ala	Val	Val	Glu	Ile	Asn	Ile	Ala	Val	Ile	His	Ser		
410					415						420				425		
ttt	cag	aag	cag	aat	gtg	acc	atc	atg	gac	cac	cac	tcg	gct	gca	gaa	1529	
Phe	Gln	Lys	Gln	Asn	Val	Thr	Ile	Met	Asp	His	His	Ser	Ala	Ala	Glu		
				430					435					440			
tcc	ttc	atg	aag	tac	atg	cag	aat	gaa	tac	cgg	tcc	cgt	ggg	ggc	tgc	1577	
Ser	Phe	Met	Lys	Tyr	Met	Gln	Asn	Glu	Tyr	Arg	Ser	Arg	Gly	Gly	Cys		
			445					450					455				
cgg	gca	gac	tgg	att	tgg	ctg	gtc	cct	ccc	atg	tct	ggg	agc	atc	acc	1625	
Pro	Ala	Asp	Trp	Ile	Trp	Leu	Val	Pro	Pro	Met	Ser	Gly	Ser	Ile	Thr		
			460				465					470					
ccc	gtg	ttt	cac	cag	gag	atg	ctg	aac	tac	gtc	ctg	tcc	cct	ttc	tac	1673	
Pro	Val	Phe	His	Gln	Glu	Met	Leu	Asn	Tyr	Val	Leu	Ser	Pro	Phe	Tyr		

Tyr	Tyr	Gln	Val	Glu	Ala	Trp	Lys	Thr	His	Val	Trp	Gln	Asp	Glu	Lys		
490					495					500					505		
cgg	aga	ccc	aag	aga	aga	gag	att	cca	ttg	aaa	gtc	ttg	gtc	aaa	gct	1769	
Arg	Arg	Pro	Lys	Arg	Arg	Glu	Ile	Pro	Leu	Lys	Val	Leu	Val	Lys	Ala		
				510					515					520			
gtg	ctc	ttt	gcc	tgt	atg	ctg	atg	cgc	aag	aca	atg	gcg	tcc	cga	gtc	1817	
Val	Leu	Phe	Ala	Cys	Met	Leu	Met	Arg	Lys	Thr	Met	Ala	Ser	Arg	Val		
			525					530					535				
aga	gtc	acc	atc	ctc	ttt	gcg	aca	gag	aca	gga	aaa	tca	gag	gcg	ctg	1865	
Arg	Val	Thr	Ile	Leu	Phe	Ala	Thr	Glu	Thr	Gly	Lys	Ser	Glu	Ala	Leu		
		540						545				550					
gcc	tgg	gac	ctg	ggg	gcc	tta	ttc	agc	tgt	gcc	ttc	aac	ccc	aag	gtt	1913	
Ala	Trp	Asp	Leu	Gly	Ala	Leu	Phe	Ser	Cys	Ala	Phe	Asn	Pro	Lys	Val		
	555					560					565						
gtc	tgc	atg	gat	aag	tac	agg	ctg	agc	tgc	ctg	gag	gag	gaa	cgg	ctg	1961	
Val	Cys	Met	Asp	Lys	Tyr	Arg	Leu	Ser	Cys	Leu	Glu	Glu	Glu	Arg	Leu		
570					575					580					585		
ctg	ttg	gtg	gtg	acc	agt	acg	ttt	ggc	aat	gga	gac	tgc	cct	ggc	aat	2009	
Leu	Leu	Val	Val	Thr	Ser	Thr	Phe	Gly	Asn	Gly	Asp	Cys	Pro	Gly	Asn		
				590					595					600			
gga	gag	aaa	ctg	aag	aaa	tcg	ctc	ttc	atg	ctg	aaa	gag	ctc	aac	aac	2057	
Gly	Glu	Lys	Leu	Lys	Lys	Ser	Leu	Phe	Met	Leu	Lys	Glu	Leu	Asn	Asn		
			605					610					615				
aaa	ttc	agg	tac	gct	gtg	ttt	ggc	ctc	ggc	tcc	agc	atg	tac	cct	cgg	2105	
Lys	Phe	Arg	Tyr	Ala	Val	Phe	Gly	Leu	Gly	Ser	Ser	Met	Tyr	Pro	Arg		
		620					625					630					
ttc	tgc	gcc	ttt	gct	cat	gac	att	gat	cag	aag	ctg	tcc	cac	ctg	ggg	2153	
Phe	Cys	Ala	Phe	Ala	His	Asp	Ile	Asp	Gln	Lys	Leu	Ser	His	Leu	Gly		
		635				640					645						
gcc	tct	cag	ctc	acc	ccg	atg	gga	gaa	ggg	gat	gag	ctc	agt	ggg	cag	2201	
Ala	Glu	Gln	Thr	Thr	Pro	Met	Gly	Gly	Gly	Asp	Glu	Leu	Ser	Gly	Gln		

Glu	Asp	Ala	Phe	Arg	Ser	Trp	Ala	Val	Gln	Thr	Phe	Lys	Ala	Ala	Cys			
				670							675			680				
gag	acg	ttt	gat	gtc	cga	ggc	aaa	cag	cac	att	cag	atc	ccc	aag	ctc	2297		
Glu	Thr	Phe	Asp	Val	Arg	Gly	Lys	Gln	His	Ile	Gln	Ile	Pro	Lys	Leu			
				685							690			695				
tac	acc	tcc	aat	gtg	acc	tgg	gac	ccg	cac	cac	tac	agg	ctc	gtg	cag	2345		
Tyr	Thr	Ser	Asn	Val	Thr	Trp	Asp	Pro	His	His	Tyr	Arg	Leu	Val	Gln			
				700							705			710				
gac	tca	cag	cct	ttg	gac	ctc	agc	aaa	gcc	ctc	agc	agc	atg	cat	gcc	2393		
Asp	Ser	Gln	Pro	Leu	Asp	Leu	Ser	Lys	Ala	Leu	Ser	Ser	Met	His	Ala			
				715							720			725				
aag	aac	gtg	ttc	acc	atg	agg	ctc	aaa	tct	cgg	cag	aat	cta	caa	agt	2441		
Lys	Asn	Val	Phe	Thr	Met	Arg	Leu	Lys	Ser	Arg	Gln	Asn	Leu	Gln	Ser			
730					735							740			745			
ccg	aca	tcc	agc	cgt	gcc	acc	atc	ctg	gtg	gaa	ctc	tcc	tgt	gag	gat	2489		
Pro	Thr	Ser	Ser	Arg	Ala	Thr	Ile	Leu	Val	Glu	Leu	Ser	Cys	Glu	Asp			
				750							755			760 <td></td>				
ggc	caa	ggc	ctg	aac	tac	ctg	ccg	ggg	gag	cac	ctt	ggg	gtt	tgc	cca	2537		
Gly	Gln	Gly	Leu	Asn	Tyr	Leu	Pro	Gly	Glu	His	Leu	Gly	Val	Cys	Pro			
				765							770			775 <td></td>				
ggc	aac	cag	ccg	gcc	ctg	gtc	caa	ggc	atc	ctg	gag	cga	gtg	gtg	gat	2585		
Gly	Asn	Gln	Pro	Ala	Leu	Val	Gln	Gly	Ile	Leu	Glu	Arg	Val	Val	Asp			
				780							785			790 <td></td>				
ggc	ccc	aca	ccc	cac	cag	aca	gtg	cgc	ctg	gag	gac	ctg	gat	gag	agt	2633		
Gly	Pro	Thr	Pro	His	Gln	Thr	Val	Arg	Leu	Glu	Asp	Leu	Asp	Glu	Ser			
				795							800			805 <td></td>				
ggc	agc	tac	tgg	gtc	agt	gac	aag	agg	ctg	ccc	ccc	tgc	tca	ctc	agc	2681		
Gly	Ser	Tyr	Trp	Val	Ser	Asp	Lys	Arg	Leu	Pro	Pro	Cys	Ser	Leu	Ser			
810					815							820			825			
cag	gcc	ctc	acc	tac	tcc	ccg	gac	atc	acc	aca	ccc	cca	acc	cag	ctg	2729		
Gly	Ala	Thr	Thr	Thr	Gln	Pro	Asp	Ile	Thr	Thr	Pro	Pro	Thr	Gln	Leu			

Leu Leu Gln Lys Leu Ala Gln Val Ala Thr Glu Glu Pro Glu Arg Gln	
845	850 855
agg ctg gag gcc ctg tgc cag ccc tca gag tac agc aag tgg aag ttc	2825
Arg Leu Glu Ala Leu Cys Gln Pro Ser Glu Tyr Ser Lys Trp Lys Phe	
860	865 870
acc aac agc ccc aca ttc ctg gag gtg cta gag gag ttc ccg tcc ctg	2873
Thr Asn Ser Pro Thr Phe Leu Glu Val Leu Glu Glu Phe Pro Ser Leu	
875	880 885
cgg gtg tct gct ggc ttc ctg ctt tcc cag ctc ccc att ctg aag ccc	2921
Arg Val Ser Ala Gly Phe Leu Leu Ser Gln Leu Pro Ile Leu Lys Pro	
890	895 900 905
agg ttc tac tcc atc agc tcc tcc cgg gat cac acg ccc acg gaa atc	2969
Arg Phe Tyr Ser Ile Ser Ser Ser Arg Asp His Thr Pro Thr Glu Ile	
910	915 920
cac ctg act gtg gcc gtg gtc acc tac cac acc gga gat ggc cag ggt	3017
His Leu Thr Val Ala Val Val Thr Tyr His Thr Gly Asp Gly Gln Gly	
925	930 935
ccc ctg cac cac ggt gtc tgc agc aca tgg ctc aac agc ctg aag ccc	3065
Pro Leu His His Gly Val Cys Ser Thr Trp Leu Asn Ser Leu Lys Pro	
940	945 950
caa gac cca gtg ccc tgc ttt gtg cgg aat gcc agc gcc ttc cac ctc	3113
Gln Asp Pro Val Pro Cys Phe Val Arg Asn Ala Ser Ala Phe His Leu	
955	960 965
ccc gag gat ccc tcc cat cct tgc atc ctc atc ggg cct ggc aca ggc	3161
Pro Glu Asp Pro Ser His Pro Cys Ile Leu Ile Gly Pro Gly Thr Gly	
970	975 980 985
atc gtg ccc ttc cgc agt ttc tgg cag caa cgg ctc cat gac tcc cag	3209
Ile Val Pro Phe Arg Ser Phe Trp Gln Gln Arg Leu His Asp Ser Gln	
990	995 1000
cac aag gga gtg cgg gga ggc cgc atg acc ttg gtg ttt ggg tgc cgc	3257
ala tcc gln val arg gly gly arg met thr leu val phe gly cys arg	

Arg Pro Asp Glu Asp His Ile Tyr Gln Glu Glu Met Leu Glu Met Ala	
1020	1025 1030
cag aag ggg gtg ctg cat gcg gtg cac aca gcc tat tcc cgc ctg cct	3353
Gln Lys Gly Val Leu His Ala Val His Thr Ala Tyr Ser Arg Leu Pro	
1035	1040 1045
ggc aag ccc aag gtc tat gtt cag gac atc ctg cgg cag cag ctg gcc	3401
Gly Lys Pro Lys Val Tyr Val Gln Asp Ile Leu Arg Gln Gln Leu Ala	
1050	1055 1060 1065
agc gag gtg ctc cgt gtg ctc cac aag gag cca ggc cac ctc tat gtt	3449
Ser Glu Val Leu Arg Val Leu His Lys Glu Pro Gly His Leu Tyr Val	
	1070 1075 1080
tgc ggg gat gtg cgc atg gcc cgg gac gtg gcc cac acc ctg aag cag	3497
Cys Gly Asp Val Arg Met Ala Arg Asp Val Ala His Thr Leu Lys Gln	
	1085 1090 1095
ctg gtg gct gcc aag ctg aaa ttg aat gag gag cag gtc gag gac tat	3545
Leu Val Ala Ala Lys Leu Lys Leu Asn Glu Glu Gln Val Glu Asp Tyr	
	1100 1105 1110
ttc ttt cag ctc aag agc cag aag cgc tat cac gaa gat atc ttc ggt	3593
Phe Phe Gln Leu Lys Ser Gln Lys Arg Tyr His Glu Asp Ile Phe Gly	
	1115 1120 1125
gct gta ttt cct tac gag gcg aag aag gac agg gtg gcg gtg cag ccc	3641
Ala Val Phe Pro Tyr Glu Ala Lys Lys Asp Arg Val Ala Val Gln Pro	
	1130 1135 1140 1145
agc agc ctg gag atg tca gcg ctc tga ggcctacag gaggggttaa	3688
Ser Ser Leu Glu Met Ser Ala Leu	
	1150
agctgcgggc acagaactta aggatggagc cagctctgca ttatctgagg tcacagggcc	3748
tggggagatg gaggaaagtg atatecccca gcctcaagtc ttatttcctc aacgttgctc	3808
cccatcaagc cctttacttg acctcctaac aagtagcacc ctggattgat cggagcctcc	3868

gctatgcac cactgtgtat ttaactgcct tgtgtacagt tatatatgcc tetgtattta 4048
aaaaactaac acccagtcctg ttcccatgg ccacttgggt cttccctgta tgattccttg 4108
atggagatat ttacatgaat tgcattttac tttaatc 4145

<210> 4
<211> 21
<212> DNA
<213> Artificial Sequence

<223> PCR Primer

<400> 4
ggtggaagcg gtaacaaagg a 21

<210> 5
<211> 19
<212> DNA
<213> Artificial Sequence

<223> PCR Primer

<400> 5
tgcttggtgg cgaagatga 19

<210> 6
<211> 30
<212> DNA
<213> Artificial Sequence

<223> PCR Probe

<400> 6
aacaacagga acctaccaac tgacgggaga 30

19

20

20

***** 100 ***** 60

60

agccagctgc aagccccaca gtgaagaaca tetgagctca aatccagata agtgacataa 180

gtgacctgct ttgtaaagcc atagag atg gcc tgt cct tgg aaa ttt ctg ttc 233
Met Ala Cys Pro Trp Lys Phe Leu Phe
1 5

aag acc aaa ttc cac cag tat gca atg aat ggg gaa aaa gac atc aac 281
Lys Thr Lys Phe His Gln Tyr Ala Met Asn Gly Glu Lys Asp Ile Asn
10 15 20 25

aac aat gtg gag aaa gcc ccc tgt gcc acc tcc agt cca gtg aca cag 329
Asn Asn Val Glu Lys Ala Pro Cys Ala Thr Ser Ser Pro Val Thr Gln
30 35 40

gat gac ctt cag tat cac aac ctc agc aag cag cag aat gag tcc ccg 377
Asp Asp Leu Gln Tyr His Asn Leu Ser Lys Gln Gln Asn Glu Ser Pro
45 50 55

cag ccc ctc gtg gag acg gga aag aag tct cca gaa tct ctg gtc aag 425
Gln Pro Leu Val Glu Thr Gly Lys Lys Ser Pro Glu Ser Leu Val Lys
60 65 70

ctg gat gca acc cca ttg tcc tcc cca cgg cat gtg agg atc aaa aac 473
Leu Asp Ala Thr Pro Leu Ser Ser Pro Arg His Val Arg Ile Lys Asn
75 80 85

tgg ggc agc ggg atg act ttc caa gac aca ctt cac cat aag gcc aaa 521
Trp Gly Ser Gly Met Thr Phe Gln Asp Thr Leu His His Lys Ala Lys
90 95 100 105

ggg att tta act tgc agg tcc aaa tct tgc ctg ggg tcc att atg act 569
Gly Ile Leu Thr Cys Arg Ser Lys Ser Cys Leu Gly Ser Ile Met Thr
110 115 120

ccc aaa agt ttg acc aga gaa ccc agg gac aag cct acc cct cca gat 617
Pro Lys Ser Leu Thr Arg Gly Pro Arg Asp Lys Pro Thr Pro Pro Asp
125 130 135

gag ctt cta cct caa gct atc gaa ttt gtc aac caa tat tac ggc tcc 665
Glu Leu Leu Pro Gln Ala Ile Glu Phe Val Asn Gln Tyr Tyr Gly Ser
140 145 150

155	160	165	
aca aag gag ata gaa aca aca gga acc tac caa ctg acg gga gat gag			761
Thr Lys Glu Ile Glu Thr Thr Gly Thr Tyr Gln Leu Thr Gly Asp Glu			
170	175	180	185
ctc atc ttc gcc acc aag cag gcc tgg cgc aat gcc cca cgc tgc att			809
Leu Ile Phe Ala Thr Lys Gln Ala Trp Arg Asn Ala Pro Arg Cys Ile			
190	195	200	
ggg agg atc cag tgg tcc aac ctg cag gtc ttc gat gcc cgc agc tgt			857
Gly Arg Ile Gln Trp Ser Asn Leu Gln Val Phe Asp Ala Arg Ser Cys			
205	210	215	
tcc act gcc cgg gaa atg ttt gaa cac atc tgc aga cac gtg cgt tac			905
Ser Thr Ala Arg Glu Met Phe Glu His Ile Cys Arg His Val Arg Tyr			
220	225	230	
tcc acc aac aat ggc aac atc agg tcg gcc atc acc gtg ttc ccc cag			953
Ser Thr Asn Asn Gly Asn Ile Arg Ser Ala Ile Thr Val Phe Pro Gln			
235	240	245	
cgg agt gat ggc aag cac gac ttc cgg gtg tgg aat gct cag ctc atc			1001
Arg Ser Asp Gly Lys His Asp Phe Arg Val Trp Asn Ala Gln Leu Ile			
250	255	260	265
cgc tat gct ggc tac cag atg cca gat ggc agc atc aga ggg gac cct			1049
Arg Tyr Ala Gly Tyr Gln Met Pro Asp Gly Ser Ile Arg Gly Asp Pro			
270	275	280	
gcc aac gtg gaa ttc act cag ctg tgc atc gac ctg ggc tgg aag ccc			1097
Ala Asn Val Glu Phe Thr Gln Leu Cys Ile Asp Leu Gly Trp Lys Pro			
285	290	295	
aag tac ggc cgc ttc gat gtg gtc ccc ctg gtc ctg cag gcc aat gcc			1145
Lys Tyr Gly Arg Phe Asp Val Val Pro Leu Val Leu Gln Ala Asn Gly			
300	305	310	
cgt gac cct gag ctc ttc gaa atc cca cct gac ctt gtg ctt gag gtg			1193
Arg Asp Pro Glu Leu Phe Glu Ile Pro Pro Asp Leu Val Leu Glu Val			
315	320	325	

330	335	340	345	
tgg tac gcc ctg cct gca gtg gcc aac atg ctg ctt gag gtg ggc ggc				1289
Trp Tyr Ala Leu Pro Ala Val Ala Asn Met Leu Leu Glu Val Gly Gly				
	350	355	360	
ctg gag ttc cca ggg tgc ccc ttc aat ggc tgg tac atg ggc aca gag				1337
Leu Glu Phe Pro Gly Cys Pro Phe Asn Gly Trp Tyr Met Gly Thr Glu				
	365	370	375	
atc gga gtc cgg gac ttc tgt gac gtc cag cgc tac aac atc ctg gag				1385
Ile Gly Val Arg Asp Phe Cys Asp Val Gln Arg Tyr Asn Ile Leu Glu				
	380	385	390	
gaa gtg ggc agg aga atg ggc ctg gaa acg cac aag ctg gcc tcg ctc				1433
Glu Val Gly Arg Arg Met Gly Leu Glu Thr His Lys Leu Ala Ser Leu				
	395	400	405	
tgg aaa gac cag gct gtc gtt gag atc aac att gct gtg atc cat agt				1481
Trp Lys Asp Gln Ala Val Val Glu Ile Asn Ile Ala Val Ile His Ser				
410	415	420	425	
ttt cag aag cag aat gtg acc atc atg gac cac cac tcg gct gca gaa				1529
Phe Gln Lys Gln Asn Val Thr Ile Met Asp His His Ser Ala Ala Glu				
	430	435	440	
tcc ttc atg aag tac atg cag aat gaa tac cgg tcc cgt ggg ggc tgc				1577
Ser Phe Met Lys Tyr Met Gln Asn Glu Tyr Arg Ser Arg Gly Gly Cys				
	445	450	455	
ccg gca gac tgg att tgg ctg gtc cct ccc atg tct ggg agc atc acc				1625
Pro Ala Asp Trp Ile Trp Leu Val Pro Pro Met Ser Gly Ser Ile Thr				
	460	465	470	
ccc atg ttt cac cag gag atg ctg aac tac gtc ctg tcc cct ttc tac				1673
Pro Val Phe His Gln Glu Met Leu Asn Tyr Val Leu Ser Pro Phe Tyr				
	475	480	485	
tac tat cag gta gag gcc tgg aaa acc cat gtc tgg cag gac gag aag				1721
Tyr Tyr Gln Val Glu Ala Trp Lys Thr His Val Trp Gln Asp Glu Lys				
490	495	500	505	

510	515	520	
gtg ctc ttt gcc tgt atg ctg atg cgc aag aca atg gcg tcc cga gtc			1817
Val Leu Phe Ala Cys Met Leu Met Arg Lys Thr Met Ala Ser Arg Val			
525	530	535	
aga gtc acc atc ctc ttt gcg aca gag aca gga aaa tca gag gcg ctg			1865
Arg Val Thr Ile Leu Phe Ala Thr Glu Thr Gly Lys Ser Glu Ala Leu			
540	545	550	
gcc tgg gac ctg ggg gcc tta ttc agc tgt gcc ttc aac ccc aag gtt			1913
Ala Trp Asp Leu Gly Ala Leu Phe Ser Cys Ala Phe Asn Pro Lys Val			
555	560	565	
gtc tgc atg gat aag tac agg ctg agc tgc ctg gag gag gaa cgg ctg			1961
Val Cys Met Asp Lys Tyr Arg Leu Ser Cys Leu Glu Glu Glu Arg Leu			
570	575	580	585
ctg ttg gtg gtg acc agt acg ttt ggc aat gga gac tgc cct ggc aat			2009
Leu Leu Val Val Thr Ser Thr Phe Gly Asn Gly Asp Cys Pro Gly Asn			
590	595	600	
gga gag aaa ctg aag aaa tcg ctc ttc atg ctg aaa gag ctc aac aac			2057
Gly Glu Lys Leu Lys Lys Ser Leu Phe Met Leu Lys Glu Leu Asn Asn			
605	610	615	
aaa ttc agg tac gct gtg ttt ggc ctc ggc tcc agc atg tac cct cgg			2105
Lys Phe Arg Tyr Ala Val Phe Gly Leu Gly Ser Ser Met Tyr Pro Arg			
620	625	630	
ttc tgc gcc ttt gct cat gac att gat cag aag ctg tcc cac ctg ggg			2153
Phe Cys Ala Phe Ala His Asp Ile Asp Gln Lys Leu Ser His Leu Gly			
635	640	645	
gcc tct cag ctc acc ccg atg gga gaa ggg gat gag ctc agt ggg cag			2201
Ala Ser Gln Leu Thr Pro Met Gly Glu Gly Asp Glu Leu Ser Gly Gln			
650	655	660	665
gag gac gcc ttc cgc agc tgg gcc gtg caa acc ttc aag gca gcc tgt			2249
Glu Asp Ala Phe Arg Ser Trp Ala Val Gln Thr Phe Lys Ala Ala Cys			
670	675	680	

685	690	695	
tac acc tcc aat gtg acc tgg gac ccg cac cac tac agg ctc gtg cag			2345
Tyr Thr Ser Asn Val Thr Trp Asp Pro His His Tyr Arg Leu Val Gln			
700	705	710	
gac tca cag cct ttg gac ctc agc aaa gcc ctc agc agc atg cat gcc			2393
Asp Ser Gln Pro Leu Asp Leu Ser Lys Ala Leu Ser Ser Met His Ala			
715	720	725	
aag aac gtg ttc acc atg agg ctc aaa tct cgg cag aat cta caa agt			2441
Lys Asn Val Phe Thr Met Arg Leu Lys Ser Arg Gln Asn Leu Gln Ser			
730	735	740	745
ccg aca tcc agc cgt gcc acc atc ctg gtg gaa ctc tcc tgt gag gat			2489
Pro Thr Ser Ser Arg Ala Thr Ile Leu Val Glu Leu Ser Cys Glu Asp			
750	755	760	
ggc caa ggc ctg aac tac ctg ccg ggg gag cac ctt ggg gtt tgc cca			2537
Gly Gln Gly Leu Asn Tyr Leu Pro Gly Glu His Leu Gly Val Cys Pro			
765	770	775	
ggc aac cag ccg gcc ctg gtc caa ggc atc ctg gag cga gtg gtg gat			2585
Gly Asn Gln Pro Ala Leu Val Gln Gly Ile Leu Glu Arg Val Val Asp			
780	785	790	
ggc ccc aca ccc cac cag aca gtg cgc ctg gag gac ctg gat gag agt			2633
Gly Pro Thr Pro His Gln Thr Val Arg Leu Glu Asp Leu Asp Glu Ser			
795	800	805	
ggc agc tac tgg gtc agt gac aag agg ctg ccc ccc tgc tca ctc agc			2681
Gly Ser Tyr Trp Val Ser Asp Lys Arg Leu Pro Pro Cys Ser Leu Ser			
810	815	820	825
cag gcc ctc acc tac tcc ccg gac atc acc aca ccc cca acc cag ctg			2729
Gln Ala Leu Thr Tyr Ser Pro Asp Ile Thr Thr Pro Pro Thr Gln Leu			
830	835	840	
ctg ctc caa aag ctg gcc cag gtg gcc aca gaa gag cct gag aga cag			2777
Leu Leu Gln Lys Leu Ala Gln Val Ala Thr Glu Glu Pro Glu Arg Gln			
845	850	855	

860	865	870	
acc aac agc ccc aca ttc ctg gag gtg cta gag gag ttc ccg tcc ctg			2873
Thr Asn Ser Pro Thr Phe Leu Glu Val Leu Glu Glu Phe Pro Ser Leu			
875	880	885	
cgg gtg tct gct ggc ttc ctg ctt tcc cag ctc ccc att ctg aag ccc			2921
Arg Val Ser Ala Gly Phe Leu Leu Ser Gln Leu Pro Ile Leu Lys Pro			
890	895	900	905
agg ttc tac tcc atc agc tcc tcc cgg gat cac acg ccc acg gag atc			2969
Arg Phe Tyr Ser Ile Ser Ser Ser Arg Asp His Thr Pro Thr Glu Ile			
910	915	920	
cac ctg act gtg gcc gtg gtc acc tac cac acc gga gat ggc cag ggt			3017
His Leu Thr Val Ala Val Val Thr Tyr His Thr Gly Asp Gly Gln Gly			
925	930	935	
ccc ctg cac cac ggt gtc tgc agc aca tgg ctc aac agc ctg aag ccc			3065
Pro Leu His His Gly Val Cys Ser Thr Trp Leu Asn Ser Leu Lys Pro			
940	945	950	
caa gac cca gtg ccc tgc ttt gtg cgg aat gcc agc gcc ttc cac ctc			3113
Gln Asp Pro Val Pro Cys Phe Val Arg Asn Ala Ser Ala Phe His Leu			
955	960	965	
ccc gag gat ccc tcc cat cct tgc atc ctc atc ggg cct ggc aca ggc			3161
Pro Glu Asp Pro Ser His Pro Cys Ile Leu Ile Gly Pro Gly Thr Gly			
970	975	980	985
atc gtg ccc ttc cgc agt ttc tgg cag caa cgg ctc cat gac tcc cag			3209
Ile Val Pro Phe Arg Ser Phe Trp Gln Gln Arg Leu His Asp Ser Gln			
990	995	1000	
cac aag gga atg cgg gga ggc cgc atg acc ttg gtg ttt ggg tgc cgc			3257
His Lys Gly Val Arg Gly Gly Arg Met Thr Leu Val Phe Gly Cys Arg			
1005	1010	1015	
cgc cca gat gag gac cac atc tac cag gag gag atg ctg gag atg gcc			3305
Arg Pro Asp Glu Asp His Ile Tyr Gln Glu Glu Met Leu Glu Met Ala			
1020	1025	1030	

1035	1040	1045	
ggc aag ccc aag gtc tat gtt cag gac atc ctg cgg cag cag ctg gcc			3401
Gly Lys Pro Lys Val Tyr Val Gln Asp Ile Leu Arg Gln Gln Leu Ala			
1050	1055	1060	1065
agc gag gtg ctc cgt gtg ctc cac aag gag cca ggc cac ctc tat gtt			3449
Ser Glu Val Leu Arg Val Leu His Lys Glu Pro Gly His Leu Tyr Val			
1070	1075	1080	
tgc ggg gat gtg cgc atg gcc cgg gac gtg gcc cac acc ctg aag cag			3497
Cys Gly Asp Val Arg Met Ala Arg Asp Val Ala His Thr Leu Lys Gln			
1085	1090	1095	
ctg gtg gct gcc aag ctg aaa ttg aat gag gag cag gtc gag gac tat			3545
Leu Val Ala Ala Lys Leu Lys Leu Asn Glu Glu Gln Val Glu Asp Tyr			
1100	1105	1110	
ttc ttt cag ctc aag agc cag aag cgc tat cac gaa gat atc ttc ggt			3593
Phe Phe Gln Leu Lys Ser Gln Lys Arg Tyr His Glu Asp Ile Phe Gly			
1115	1120	1125	
gct gta ttt cct tac gag gcg aag aag gac agg gtg gcg gtg cag ccc			3641
Ala Val Phe Pro Tyr Glu Ala Lys Lys Asp Arg Val Ala Val Gln Pro			
1130	1135	1140	1145
agc agc ctg gag atg tca gcg ctc tga gggcctacag gaggggttaa			3688
Ser Ser Leu Glu Met Ser Ala Leu			
1150			
agctgccggc acagaactta aggatggagc cagctctgca ttatctgagg tcacagggcc			3748
tggggagatg gaggaaagtg atatccccc aacctcaagtc ttatttctctc aacgttgctc			3808
cccatcaagc cctttacttg acctcctaac aagtagcacc ctggattgat cggagcctcc			3868
tctctcaaac tggggcctcc ctggctccctt ggagacaaaa tcttaaattgc caggcctggc			3928
gagtgggtga aagatggaac ttgctgctga gtgcaccact tcaagtgacc accaggaggt			3988
ctctctctctc cctctctctc ctctctctctc ctctctctctc ctctctctctc			4048

a'ggagatat ttacatgaat tgcattttac tttaate

4145

<210> 11

<211> 23

<212> DNA

<213> Artificial Sequence

<223> PCR Primer

<400> 11

cgtccacagt atgtgaggat caa

23

<210> 12

<211> 22

<212> DNA

<213> Artificial Sequence

<223> PCR Primer

<400> 12

caagcaagac ttggacttgc aa

22

<210> 13

<211> 26

<212> DNA

<213> Artificial Sequence

<223> PCR Probe

<400> 13

tttcaccac aaggeccacat cggatt

26

<210> 14

<211> 20

<212> DNA

<213> Artificial Sequence

ggcaaatcca acggcacagt

20

<210> 15

<211> 20

<212> DNA

<213> Artificial Sequence

<223> PCR Primer

<400> 15

gggtctcgct cctggaagct

20

<210> 16

<211> 27

<212> DNA

<213> Artificial Sequence

<223> PCR Probe

<400> 16

aaggccgaga atgggaagct tgtcac

27

<210> 17

<211> 5484

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (34)...(3960)

<400> 17

aartgtcagg acgggatctg agacttccaa aaa atg aag ccg gcg aca gga ctt
Met Lys Pro Ala Thr Gly Leu

54

1

5

tgg gtc tgg gtc acc ctt ctc gtg gcg gcg ggg acc gtc cag ccc agc
Trp Val Trp Val Ser Leu Leu Val Ala Ala Gly Thr Val Gln Pro Ser

102

Asp Ser Gln Ser Val Cys Ala Gly Thr Glu Asn Lys Leu Ser Ser Leu	
25 30 35	
tct gac ctg gaa cag cag tac cga gcc ttg cgc aag tac tat gaa aac	193
Ser Asp Leu Glu Gln Gln Tyr Arg Ala Leu Arg Lys Tyr Tyr Glu Asn	
40 45 50 55	
tgt gag gtt gtc atg ggc aac ctg gag ata acc agc att gag cac aac	246
Cys Glu Val Val Met Gly Asn Leu Glu Ile Thr Ser Ile Glu His Asn	
60 65 70	
cgg gac ctc tcc ttc ctg cgg tct gtt cga gaa gtc aca ggc tac gtg	294
Arg Asp Leu Ser Phe Leu Arg Ser Val Arg Glu Val Thr Gly Tyr Val	
75 80 85	
tta gtg gct ctt aat cag ttt cgt tac ctg cct ctg gag aat tta cgc	342
Leu Val Ala Leu Asn Gln Phe Arg Tyr Leu Pro Leu Glu Asn Leu Arg	
90 95 100	
att att cgt ggg aca aaa ctt tat gag gat cga tat gcc ttg gca ata	390
Ile Ile Arg Gly Thr Lys Leu Tyr Glu Asp Arg Tyr Ala Leu Ala Ile	
105 110 115	
ttt tta aac tac aga aaa gat gga aac ttt gga ctt caa gaa ctt gga	438
Phe Leu Asn Tyr Arg Lys Asp Gly Asn Phe Gly Leu Gln Glu Leu Gly	
120 125 130 135	
tta aag aac ttg aca gaa atc cta aat ggt gga gtc tat gta gac cag	486
Leu Lys Asn Leu Thr Glu Ile Leu Asn Gly Gly Val Tyr Val Asp Gln	
140 145 150	
aac aaa ttc ctt tgt tat gca gac acc att cat tgg caa gat att gtt	534
Asn Lys Phe Leu Cys Tyr Ala Asp Thr Ile His Trp Gln Asp Ile Val	
155 160 165	
cgg aac cca tgg cct tcc aac ttg act ctt gtg tca aca aat ggt act	582
Arg Asn Pro Trp Pro Ser Asn Leu Thr Leu Val Ser Thr Asn Gly Ser	
170 175 180	
tca gga tgt gga cgt tgc cat aag tcc tct act ggc cgt tgc tgg gga	630
Pro Gly Cys Gly Arg Cys His Lys Ser Cys Thr Gly Arg Cys Trp Gly	

Pro Thr Glu Asn His Cys Gln Thr Leu Thr Arg Thr Val Cys Ala Glu	
200	215
caa tgt gac ggc aga tgc tac gga cct tac gtc agt gac tgc tgc cat	726
Gln Cys Asp Gly Arg Cys Tyr Gly Pro Tyr Val Ser Asp Cys Cys His	
220	230
cga gaa tgt gct gga ggc tgc tca gga cct aag gac aca gac tgc ttt	774
Arg Glu Cys Ala Gly Gly Cys Ser Gly Pro Lys Asp Thr Asp Cys Phe	
235	245
gcc tgc atg aat ttc aat gac agt gga gca tgt gtt act cag tgt ccc	822
Ala Cys Met Asn Phe Asn Asp Ser Gly Ala Cys Val Thr Gln Cys Pro	
250	260
caa acc ttt gtc tac aat cca acc acc ttt caa ctg gag cac aat ttc	870
Gln Thr Phe Val Tyr Asn Pro Thr Thr Phe Gln Leu Glu His Asn Phe	
265	275
aat gca aag tac aca tat gga gca ttc tgt gtc aag aaa tgt cca cat	918
Asn Ala Lys Tyr Thr Tyr Gly Ala Phe Cys Val Lys Lys Cys Pro His	
280	295
aac ttt gtg gta gat tcc agt tct tgt gtg cgt gcc tgc cct agt tcc	966
Asn Phe Val Val Asp Ser Ser Ser Cys Val Arg Ala Cys Pro Ser Ser	
300	310
aag atg gaa gta gaa gaa aat ggg att aaa atg tgt aaa cct tgc act	1014
Lys Met Glu Val Glu Glu Asn Gly Ile Lys Met Cys Lys Pro Cys Thr	
315	325
gac att tgc cca aaa gct tgt gat ggc att ggc aca gga tca ttg atg	1062
Asp Ile Cys Pro Lys Ala Cys Asp Gly Ile Gly Thr Gly Ser Leu Met	
330	340
tca gct cag act gtg gat tcc agt aac att gac aaa ttc ata aac tct	1110
Ser Ala Gln Thr Val Asp Ser Ser Asn Ile Asp Lys Phe Ile Asn Cys	
345	355
acc aag atc aat ggg aat ttg atc ttt cta gtc act ggt att cat ggg	1158
Ala Thr Ile Asn Gly Asp Thr Ile Phe Leu Val Thr Gly Ile His Gly	

Asp Pro Tyr Asn Ala Ile Glu Ala Ile Asp Pro Glu Lys Leu Asn Val	
380 385 390	
ttt cgg aca gtc aga gag ata aca ggt ttc ctg aac ata cag tca tgg	1254
Phe Arg Thr Val Arg Glu Ile Thr Gly Phe Leu Asn Ile Gln Ser Trp	
395 400 405	
cca cca aac atg act gac ttc agt gtt ttt tct aac ctg gtg acc att	1302
Pro Pro Asn Met Thr Asp Phe Ser Val Phe Ser Asn Leu Val Thr Ile	
410 415 420	
ggg gga aga gta ctc tat agt ggc ctg tcc ttg ctt atc ctc aag caa	1350
Gly Gly Arg Val Leu Tyr Ser Gly Leu Ser Leu Leu Ile Leu Lys Gln	
425 430 435	
cag ggc atc acc tct cta cag ttc cag tcc ctg aag gaa atc agc gca	1398
Gln Gly Ile Thr Ser Leu Gln Phe Gln Ser Leu Lys Glu Ile Ser Ala	
440 445 450 455	
gga aac atc tat att act gac aac agc aac ctg tgt tat tat cat acc	1446
Gly Asn Ile Tyr Ile Thr Asp Asn Ser Asn Leu Cys Tyr Tyr His Thr	
460 465 470	
att aac tgg aca aca ctc ttc agc aca atc aac cag aga ata gta atc	1494
Ile Asn Trp Thr Thr Leu Phe Ser Thr Ile Asn Gln Arg Ile Val Ile	
475 480 485	
cgg gac aac aga aaa gct gaa aat tgt act gct gaa gga atg gtg tgc	1542
Arg Asp Asn Arg Lys Ala Glu Asn Cys Thr Ala Glu Gly Met Val Cys	
490 495 500	
aac cat ctg tgt tcc agt gat ggc tgt tgg gga cct ggg cca gac caa	1590
Asn His Leu Cys Ser Ser Asp Gly Cys Trp Gly Pro Gly Pro Asp Gln	
505 510 515	
tgt ctg tgg tgt cgc cgc ttc agt aga gga agg atc tgc ata gag tct	1638
Cys Leu Ser Cys Arg Arg Phe Ser Arg Gly Arg Ile Cys Ile Glu Ser	
520 525 530 535	
tgt aac ctc tat gat ggt gaa ttt cgg gag ttt gag aat ggc tcc atc	1686
Cys Asn Leu Tyr Asp Gly Glu Phe Arg Glu Phe Glu Asn Gly Ser Ile	

Cys Val Glu Cys Asp Pro Gln Cys Glu Lys Met Glu Asp Gly Leu Leu	
555	560 565
aca tgc cat gga ccg ggt cct gac aac tgt aca aag tgc tct cat ttt	1782
Thr Cys His Gly Pro Gly Pro Asp Asn Cys Thr Lys Cys Ser His Phe	
570	575 580
aaa gat ggc cca aac tgt gtg gaa aaa tgt cca gat ggc tta cag ggg	1830
Lys Asp Gly Pro Asn Cys Val Glu Lys Cys Pro Asp Gly Leu Gln Gly	
585	590 595
gca aac agt ttc att ttc aag tat gct gat cca gat cgg gag tgc cac	1878
Ala Asn Ser Phe Ile Phe Lys Tyr Ala Asp Pro Asp Arg Glu Cys His	
600	605 610 615
cca tgc cat cca aac tgc acc caa ggg tgt aac ggt ccc act agt cat	1926
Pro Cys His Pro Asn Cys Thr Gln Gly Cys Asn Gly Pro Thr Ser His	
620	625 630
gac tgc att tac tac cca tgg acg ggc cat tcc act tta cca caa cat	1974
Asp Cys Ile Tyr Tyr Pro Trp Thr Gly His Ser Thr Leu Pro Gln His	
635	640 645
gct aga act ccc ctg att gca gct gga gta att ggt ggg ctc ttc att	2022
Ala Arg Thr Pro Leu Ile Ala Ala Gly Val Ile Gly Gly Leu Phe Ile	
650	655 660
ctg gtc att gtg ggt ctg aca ttt gct gtt tat gtt aga agg aag agc	2070
Leu Val Ile Val Gly Leu Thr Phe Ala Val Tyr Val Arg Arg Lys Ser	
665	670 675
atc aaa aag aaa aga gcc ttg aga aga ttc ttg gaa aca gag ttg gtg	2118
Ile Lys Lys Lys Arg Ala Leu Arg Arg Phe Leu Glu Thr Glu Leu Val	
680	685 690 695
gaa cca tta act ccc agt ggc aca gca ccc aat caa gct caa ctt cgt	2166
Glu Pro Leu Thr Pro Ser Gly Thr Ala Pro Asn Gln Ala Gln Leu Arg	
700	705 710
att ttg aaa gaa act gag ctg aag agg gta aaa gtc ctt ggc tca ggt	2214
Ala Thr Thr Gln Thr Gly Leu Lys Arg Val Lys Val Leu Gly Ser Gly	

Ala Phe Gly Thr Val Tyr Lys Gly Ile Trp Val Pro Glu Gly Glu Thr	
730 735 740	
gtg aag att cct gtg gct att aag att ctt aat gag aca act ggt ccc	2310
Val Lys Ile Pro Val Ala Ile Lys Ile Leu Asn Glu Thr Thr Gly Pro	
745 750 755	
aag gca aat gtg gag ttc atg gat gaa gct ctg atc atg gca agt atg	2358
Lys Ala Asn Val Glu Phe Met Asp Glu Ala Leu Ile Met Ala Ser Met	
760 765 770 775	
gat cat cca cac cta gtc cgg ttg ctg ggt gtg tgt ctg agc cca acc	2406
Asp His Pro His Leu Val Arg Leu Leu Gly Val Cys Leu Ser Pro Thr	
780 785 790	
atc cag ctg gtt act caa ctt atg ccc cat qgc tgc ctg ttg gag tat	2454
Ile Gln Leu Val Thr Gln Leu Met Pro His Gly Cys Leu Leu Glu Tyr	
795 800 805	
gtc cac gag cac aag gat aac att gga tca caa ctg ctg ctt aac tgg	2502
Val His Glu His Lys Asp Asn Ile Gly Ser Gln Leu Leu Leu Asn Trp	
810 815 820	
tgt gtc cag ata gct aag gga atg atg tac ctg gaa gaa aga cga ctc	2550
Cys Val Gln Ile Ala Lys Gly Met Met Tyr Leu Glu Glu Arg Arg Leu	
825 830 835	
gtt cat cgg gat ttg gca gcc cgt aat gtc tta gtg aaa tct cca aac	2598
Val His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Ser Pro Asn	
840 845 850 855	
cat gtg aaa atc aca gat ttt ggg cta gcc aga ctc ttg gaa gga gat	2646
His Val Lys Ile Thr Asp Phe Gly Leu Ala Arg Leu Leu Glu Gly Asp	
860 865 870	
gaa aaa gag tac aat get gat gga gga aag atg cca att aaa tgg atg	2694
Glu Lys Glu Tyr Asn Ala Asp Gly Gly Lys Met Pro Ile Lys Trp Met	
875 880 885	
get ctg gag tgt ata cat tac agg aaa ttc acc cat cag agt gac gtt	2742
Ala Thr Gly Cys Thr His Tyr Asn Lys Phe Thr His Gln Ser Asp Val	

Trp Ser Tyr Gly Val Thr Ile Trp Glu Leu Met Thr Phe Gly Gly Lys	
905	910 915
ccc tat gat gga att cca acg cga gaa atc cct gat tta tta gag aaa	2838
Pro Tyr Asp Gly Ile Pro Thr Arg Glu Ile Pro Asp Leu Leu Glu Lys	
920	925 930 935
gga gaa cgt ttg cct cag cct ccc atc tgc act att gac gtt tac atg	2886
Gly Glu Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp Val Tyr Met	
940	945 950
gtc atg gtc aaa tgt tgg atg att gat gct gac agt aga cct aaa ttt	2934
Val Met Val Lys Cys Trp Met Ile Asp Ala Asp Ser Arg Pro Lys Phe	
955	960 965
aag gaa ctg gct gct gag ttt tca agg atg gct cga gac cct caa aga	2982
Lys Glu Leu Ala Ala Glu Phe Ser Arg Met Ala Arg Asp Pro Gln Arg	
970	975 980
tac cta gtt att cag ggt gat gat cgt atg aag ctt ccc agt cca aat	3030
Tyr Leu Val Ile Gln Gly Asp Asp Arg Met Lys Leu Pro Ser Pro Asn	
985	990 995
gac agc aag ttc ttt cag aat ctc ttg gat gaa gag gat ttg gaa gat	3078
Asp Ser Lys Phe Phe Gln Asn Leu Leu Asp Glu Glu Asp Leu Glu Asp	
1000	1005 1010 1015
atg atg gat gct gag gag tac ttg gtc cct cag gct ttc aac atc cca	3126
Met Met Asp Ala Glu Glu Tyr Leu Val Pro Gln Ala Phe Asn Ile Pro	
1020	1025 1030
cct ccc atc tat act tcc aga gca aga att gac tcg aat agg agt gaa	3174
Pro Pro Ile Tyr Thr Ser Arg Ala Arg Ile Asp Ser Asn Arg Ser Glu	
1035	1040 1045
att gga cac agc cct cct cct gcc tac acc ccc atg tca gga aac cag	3222
Ile Gly His Ser Pro Pro Pro Ala Tyr Thr Pro Met Ser Gly Asn Gln	
1050	1055 1060
ttt gta tac cga gat gga ggt ttt gct gct gaa caa gga gtg tct gtg	3270
Phe Val Tyr Arg Asp Gly Gly Phe Ala Ala Glu Gln Gly Val Ser Val	

Pro Tyr Arg Ala Pro Thr Ser Thr Ile Pro Glu Ala Pro Val Ala Gln	
1080	1085 1090 1095
ggt gct act gct gag att ttt gat gac tcc tgc tgt aat ggc acc cta	3366
Gly Ala Thr Ala Glu Ile Phe Asp Asp Ser Cys Cys Asn Gly Thr Leu	
1100 1105 1110	
cgc aag cca gtg gca ccc cat gtc caa gag gac agt agc acc cag agg	3414
Arg Lys Pro Val Ala Pro His Val Gln Glu Asp Ser Ser Thr Gln Arg	
1115 1120 1125	
tac agt gct gac ccc acc gtg ttt gcc cca gaa cgg agc cca cga gga	3462
Tyr Ser Ala Asp Pro Thr Val Phe Ala Pro Glu Arg Ser Pro Arg Gly	
1130 1135 1140	
gag ctg gat gag gaa ggt tac atg act cct atg cga gac aaa ccc aaa	3510
Glu Leu Asp Glu Glu Gly Tyr Met Thr Pro Met Arg Asp Lys Pro Lys	
1145 1150 1155	
caa gaa tac ctg aat cca gtg gag gag aac cct ttt gtt tct cgg aga	3558
Gln Glu Tyr Leu Asn Pro Val Glu Glu Asn Pro Phe Val Ser Arg Arg	
1160 1165 1170 1175	
aaa aat gga gac ctt caa gca ttg gat aat ccc gaa tat cac aat gca	3606
Lys Asn Gly Asp Leu Gln Ala Leu Asp Asn Pro Glu Tyr His Asn Ala	
1180 1185 1190	
tcc aat ggt cca ccc aag gcc gag gat gag tat gtg aat gag cca ctg	3654
Ser Asn Gly Pro Pro Lys Ala Glu Asp Glu Tyr Val Asn Glu Pro Leu	
1195 1200 1205	
tac ctc aac acc ttt gcc aac acc ttg gga aaa gct gag tac ctg aag	3702
Tyr Leu Asn Thr Phe Ala Asn Thr Leu Gly Lys Ala Glu Tyr Leu Lys	
1210 1215 1220	
aac aac ata ctg tca atg cca gag aag gcc aag aaa gcg ttt gac aac	3750
Asn Asn Ile Leu Ser Met Pro Glu Lys Ala Lys Lys Ala Phe Asp Asn	
1225 1230 1235	
cct gac tac tgg aac cac agc ctg cca cct cgg agc acc ctt cag cac	3798
Pro Leu Thr Thr Ser His Ser Leu Pro Pro Arg Ser Thr Leu Gln His	

Pro Asp Tyr Leu Gln Glu Tyr Ser Thr Lys Tyr Phe Tyr Lys Gln Asn
1260 1265 1270

ggg cgg atc cgg cct att gtg gca gag aat cct gaa tac ctc tct gag 3894
Gly Arg Ile Arg Pro Ile Val Ala Glu Asn Pro Glu Tyr Leu Ser Glu
1275 1280 1285

ttc tcc ctg aag cca ggc act gtg ctg ccg cct cca cct tac aga cac 3942
Phe Ser Leu Lys Pro Gly Thr Val Leu Pro Pro Pro Tyr Arg His
1290 1295 1300

cgg aat act gtg gtg taa gctcagttgt ggttttttag gtggagagac acacctgctc 4000
Arg Asn Thr Val Val
1305

caatttcccc accccctctt ctttctctgg tggctcttct tctaccccaa ggccagtagt 4060

tttgacactt cccagtggaa gatacagaga tgcaatgata gttatgtgct tacctaactt 4120

gaacattaga gggaaagact gaaagagaaa gataggagga accacaatgt ttcttcattt 4180

ctctgcatgg gttggtcagg agaataaaac agctagagaa ggaccagaaa atgtaaggca 4240

atgtgccta ctatcaaact agctgtcact ttttttcttt ttcttttctt ttctttgttt 4300

ctttcttctt cttctttttt tttttttttt taaagcagat ggttgaaaca cccatgctat 4360

ctgttcttat ctgcaggaac tgatgtgtgc atatttagca tccctggaaa tcataataaa 4420

gtttccatta gaacaaaaga ataacatttt ctataacata tgatagtgtc tgaaattgag 4480

aatccagttt ctttccccag cagtttctgt cctagcaagt aagaatggcc aactcaactt 4540

tcataattta aaaatctcca ttaaagttat aactagtaat tatgttttca acactttttg 4600

gttttttca tttgttttg ctctgaccca ttcttttata ttgctcccc tatttttggc 4660

tttaatttct aattgcaaag atgtttacat caaagcttct tcacagaatt taagcaagaa 4720

atattttaat atagtgaat ggccactact ttaagatata aatcttttaa ataagaaagg 4780

gggaaactaa gagacagttc tctgtgggtc aggaaaacta ctgatacttt caggggtggc 4960
ccaatgaggg aatccattga actggaagaa acacactgga ttgggtatgt ctacctggca 5020
gatactcaga aatgtagttt gcacttaagc tgtaatttta tttgttcttt ttctgaactc 5080
cattttggat tttgaatcaa gcaatatgga agcaaccagc aaattaacta atttaagtac 5140
atttttaaaa aaagagctaa gataaagact gtggaaatgc caaaccaagc aaattaggaa 5200
ccttgcaacg gtatccaggg actatgatga gaggccagca cattatcttc atatgtcacc 5260
tttgctacgc aaggaaatth gtccagttcg tatacttcgt aagaaggaat gcgagtaagg 5320
attggcttga attccatgga atttctagta tgagactatt tatatgaagt agaaggtaac 5380
tctttgcaca taaattggta taataaaaag aaaaacacaa acattcaaag cttagggata 5440
ggtccttggg tcaaaagttg taaataaatg tgaaacatct tctc 5484

<210> 18

<211> 3690

<212> DNA

<213> Mus musculus

<220>

<221> CDS

<222> (256)...(3690)

<400> 18

ctggaggggt ataaatacct gatggctgct gccaggggtca caactttaca gggagttgaa 60
gattgagact ctgccccac ggaacacagt gtcactggtt tgaacttct cagccaactt 120
ggatgaaggga ctgagctggt agagacactt ctgaggtctc tcacgcttgg gtcttgttca 180
ctccacggag tagcctagtc aactgcaaga gaacggagaa cgttggattt ggagcagaag 240
tgcaaaqlet cadac atd qct tgc ccc tgg aad ttt etc ttc aaa gtc aaa 291

tcc tac caa agt gac ctg aaa gag gaa aag gac att aac aac aac gtg	339
Ser Tyr Gln Ser Asp Leu Lys Glu Glu Lys Asp Ile Asn Asn Asn Val	
15 20 25	
aag aaa acc cct tgt gct gtt ctc agc cca aca ata caa gat gac cct	387
Lys Lys Thr Pro Cys Ala Val Leu Ser Pro Thr Ile Gln Asp Asp Pro	
30 35 40	
aag agt cac caa aat ggc tcc ccg cag ctc ctc act ggg aca gca cag	435
Lys Ser His Gln Asn Gly Ser Pro Gln Leu Leu Thr Gly Thr Ala Gln	
45 50 55 60	
aat gtt cca gaa tcc ctg gac aag ctg cat gtg aca tcg acc cgt cca	483
Asn Val Pro Glu Ser Leu Asp Lys Leu His Val Thr Ser Thr Arg Pro	
65 70 75	
cag tat gtg agg atc aaa aac tgg ggc agt gga gag att ttg cat gac	531
Gln Tyr Val Arg Ile Lys Asn Trp Gly Ser Gly Glu Ile Leu His Asp	
80 85 90	
act ctt cac cac aag gcc aca tcg gat ttc act tgc aag tcc aag tct	579
Thr Leu His His Lys Ala Thr Ser Asp Phe Thr Cys Lys Ser Lys Ser	
95 100 105	
tgc ttg ggg tcc atc atg aac ccc aag agt ttg acc aga gga ccc aga	627
Cys Leu Gly Ser Ile Met Asn Pro Lys Ser Leu Thr Arg Gly Pro Arg	
110 115 120	
gac aag cct acc cct ctg gag gag ctc ctg cct cat gcc att gag ttc	675
Asp Lys Pro Thr Pro Leu Glu Glu Leu Leu Pro His Ala Ile Glu Phe	
125 130 135 140	
atc aac cag tat tat ggc tcc ttt aaa gag gca aaa ata gag gaa cat	723
Ile Asn Gln Tyr Tyr Gly Ser Phe Lys Glu Ala Lys Ile Glu Glu His	
145 150 155	
ctg gcc agg ctg gaa gct gta aca aag gaa ata gaa aca aca gga acc	771
Leu Ala Arg Leu Glu Ala Val Thr Lys Glu Ile Glu Thr Thr Gly Thr	
160 165 170	
act agt ctc att ctg gat gag ctc atc ttt gcc acc aag ata gcc tgg	819

ggt tgg tac atg ggc acc gag att gga gtt cga gac ttc tgt gac aca 1395
Gly Trp Tyr Met Gly Thr Glu Ile Gly Val Arg Asp Phe Cys Asp Thr
365 370 375 380

cag cgc tac aac atc ctg gag gaa gtg ggc cga agg atg ggc ctg gag 1443
Gln Arg Tyr Asn Ile Leu Glu Glu Val Gly Arg Arg Met Gly Leu Glu
385 390 395

acc cac aca ctg gcc tcc ctc tgg aaa gac cgg gct gtc acg gag atc 1491
Thr His Thr Leu Ala Ser Leu Trp Lys Asp Arg Ala Val Thr Glu Ile
400 405 410

aat gtg gct gtg ctc cat agt ttc cag aag cag aat gtg acc atc atg 1539
Asn Val Ala Val Leu His Ser Phe Gln Lys Gln Asn Val Thr Ile Met
415 420 425

gac cac cac aca gcc tca gag tcc ttc atg aag cac atg cag aat gag 1587
Asp His His Thr Ala Ser Glu Ser Phe Met Lys His Met Gln Asn Glu
430 435 440

tac cgg gcc cgt gga ggc tgc ccg gca gac tgg att tgg ctg gtc cct 1635
Tyr Arg Ala Arg Gly Gly Cys Pro Ala Asp Trp Ile Trp Leu Val Pro
445 450 455 460

cca gtg tct ggg agc atc acc cct gtg ttc cac cag gag atg ttg aac 1683
Pro Val Ser Gly Ser Ile Thr Pro Val Phe His Gln Glu Met Leu Asn
465 470 475

tat gtc cta tct cca ttc tac tac tac cag atc gag ccc tgg aag acc 1731
Tyr Val Leu Ser Pro Phe Tyr Tyr Tyr Gln Ile Glu Pro Trp Lys Thr
480 485 490

cac atc tgg cag aat gag aag ctg agg ccc agg agg aga gag atc cga 1779
His Ile Trp Gln Asn Glu Lys Leu Arg Pro Arg Arg Arg Glu Ile Arg
495 500 505

ttt aga gtc ttg gtg aaa gtg gtg ttc ttt gct tcc atg cta atg cga 1827
Phe Arg Val Leu Val Lys Val Val Phe Phe Ala Ser Met Leu Met Arg
510 515 520

atg gtc atc att tca cgg gtc att gcc aca gtc ctc ttt gct act gag 1875

aca ggg aag tct gaa gca cta gcc agg gac ctg gcc acc ttg ttc agc	1923
Thr Gly Lys Ser Glu Ala Leu Ala Arg Asp Leu Ala Thr Leu Phe Ser	
545 550 555	
tac gcc ttc aac acc aag gtt gtc tgc atg gac cag tat aag gca agc	1971
Tyr Ala Phe Asn Thr Lys Val Val Cys Met Asp Gln Tyr Lys Ala Ser	
560 565 570	
acc ttg gaa gag gag caa cta ctg ctg gtg gtg aca agc aca ttt ggg	2019
Thr Leu Glu Glu Glu Gln Leu Leu Leu Val Val Thr Ser Thr Phe Gly	
575 580 585	
aat gga gac tgt ccc agc aat ggg cag act ctg aag aaa tct ctg ttc	2067
Asn Gly Asp Cys Pro Ser Asn Gly Gln Thr Leu Lys Lys Ser Leu Phe	
590 595 600	
atg ctt aga gaa ctc aac cac acc ttc agg tat gct gtg ttt ggc ctt	2115
Met Leu Arg Glu Leu Asn His Thr Phe Arg Tyr Ala Val Phe Gly Leu	
605 610 615 620	
ggc tcc agc atg tac cct cag ttc tgc gcc ttt gct cat gac atc gac	2163
Gly Ser Ser Met Tyr Pro Gln Phe Cys Ala Phe Ala His Asp Ile Asp	
625 630 635	
cag aag ctg tcc cac ctg gga gcc tct cag ctt gcc cca aca gga gaa	2211
Gln Lys Leu Ser His Leu Gly Ala Ser Gln Leu Ala Pro Thr Gly Glu	
640 645 650	
ggg gac gaa ctc agt ggg cag gag gat gcc ttc cgc agc tgg gct gta	2259
Gly Asp Glu Leu Ser Gly Gln Glu Asp Ala Phe Arg Ser Trp Ala Val	
655 660 665	
caa acc ttc cgg gca gcc tgt gag acc ttt gat gtc cga agc aaa car	2307
Gln Thr Phe Arg Ala Ala Cys Glu Thr Phe Asp Val Arg Ser Lys His	
670 675 680	
cac att cag atc ccg aaa cgc ttc act tcc aat gca aca tgg gag cca	2355
His Ile Gln Ile Pro Lys Arg Phe Thr Ser Asn Ala Thr Trp Glu Pro	
685 690 695 700	
cag caa tat aag ctc atc cag aac ccg gag cct tta gac ctc aac aga	2403

gcc ctc agc agc atc cat gca aag aac gtg ttt acc atg agg ctg aaa 2451
 Ala Leu Ser Ser Ile His Ala Lys Asn Val Phe Thr Met Arg Leu Lys
 720 725 730

tcc cag cag aat ctg cag agt gaa aag tcc agc cgc acc acc ctc ctc 2499
 Ser Gln Gln Asn Leu Gln Ser Glu Lys Ser Ser Arg Thr Thr Leu Leu
 735 740 745

gtt cag ctc acc ttc gag ggc agc cga ggg ccc agc tac ctg cct ggg 2547
 Val Gln Leu Thr Phe Glu Gly Ser Arg Gly Pro Ser Tyr Leu Pro Gly
 750 755 760

gaa cac ctg ggg atc ttc cca ggc aac cag acc gcc ctg gtg cag gga 2595
 Glu His Leu Gly Ile Phe Pro Gly Asn Gln Thr Ala Leu Val Gln Gly
 765 770 775 780

atc ttg gag cga gtt gtg gat tgt cct aca cca cac caa act gtg tgc 2643
 Ile Leu Glu Arg Val Val Asp Cys Pro Thr Pro His Gln Thr Val Cys
 785 790 795

ctg gag gtt ctg gat gag agc ggc agc tac tgg gtc aaa gac aag agg 2691
 Leu Glu Val Leu Asp Glu Ser Gly Ser Tyr Trp Val Lys Asp Lys Arg
 800 805 810

ctg ccc ccc tgc tca ctc agc caa gcc ctc acc tac ttc ctg gac att 2739
 Leu Pro Pro Cys Ser Leu Ser Gln Ala Leu Thr Tyr Phe Leu Asp Ile
 815 820 825

acg acc cct ccc acc cag ctg cag ctc cac aag ctg gct cgc ttt gcc 2787
 Thr Thr Pro Pro Thr Gln Leu Gln Leu His Lys Leu Ala Arg Phe Ala
 830 835 840

acg gac gag acg gat agg cag aga ttg gag gcc ttg tgt cag ccc tca 2835
 Thr Asp Glu Thr Asp Arg Gln Arg Leu Glu Ala Leu Cys Gln Pro Ser
 845 850 855 860

gag tac aat gac tgg aag ttc agc aac aac ccc acg ttc ctg gag gtg 2883
 Glu Tyr Asn Asp Trp Lys Phe Ser Asn Asn Pro Thr Phe Leu Glu Val
 865 870 875

att aag aag ttc cct tcc tta cat atg ccc gct acc ttc cta cta tca 2931

cag ctc cct atc ttg aag ccc cgc tac tac tcc atc agc tcc tcc cag	2979
Gln Leu Pro Ile Leu Lys Pro Arg Tyr Tyr Ser Ile Ser Ser Ser Gln	
895 900 905	
 gac cac acc ccc tcg gag gtt cac ctc act gtg gcc gtg gtc acc tac	3027
Asp His Thr Pro Ser Glu Val His Leu Thr Val Ala Val Val Thr Tyr	
910 915 920	
 cgc acc cga gat ggt cag ggt ccc ctg cac cat ggt gtc tgc agc act	3075
Arg Thr Arg Asp Gly Gln Gly Pro Leu His His Gly Val Cys Ser Thr	
925 930 935 940	
 tgg atc agg aac ctg aag ccc cag gac cca gtg ccc tgc ttt gtg cga	3123
Trp Ile Arg Asn Leu Lys Pro Gln Asp Pro Val Pro Cys Phe Val Arg	
945 950 955	
 agt gtc agt ggc ttc cag ctc cct gag gac ccc tcc cag cct tgc atc	3171
Ser Val Ser Gly Phe Gln Leu Pro Glu Asp Pro Ser Gln Pro Cys Ile	
960 965 970	
 ctc att ggg cct ggt acg ggc att gct ccc ttc cga agt ttc tgg cag	3219
Leu Ile Gly Pro Gly Thr Gly Ile Ala Pro Phe Arg Ser Phe Trp Gln	
975 980 985	
 cag cgg ctc cat gac tcc cag cac aaa ggg ctc aaa gga ggc cgc atg	3267
Gln Arg Leu His Asp Ser Gln His Lys Gly Leu Lys Gly Gly Arg Met	
990 995 1000	
 agc ttg gtg ttt ggg tgc cgg cac ccg gag gag gac cac ctc tat cag	3315
Ser Leu Val Phe Gly Cys Arg His Pro Glu Glu Asp His Leu Tyr Gln	
1005 1010 1015 1020	
 gaa gaa atg cag gag atg gtc cgc aag aga gtg ctg ttc cag gtg cac	3363
Glu Glu Met Gln Glu Met Val Arg Lys Arg Val Leu Phe Gln Val His	
1025 1030 1035	
 aca ggc tac tcc cgg ctg ccc ggc aaa ccc aag gtc tac gtt cag gac	3411
Thr Gly Tyr Ser Arg Leu Pro Gly Lys Pro Lys Val Tyr Val Gln Asp	
1040 1045 1050	
 ata atg cca gat cag ctg ggc aat gaa gta ctc agc gta ctc cac gaa	3459

gag cag ggc cac ctc tac att tgc gga gat gtg cgc atg gct cgg gat 3507
Glu Gln Gly His Leu Tyr Ile Cys Gly Asp Val Arg Met Ala Arg Asp
1070 1075 1080

gtg gct acc aca ttg aag aag ctg gtg gcc acc aag ctg aac ttg agc 3555
Val Ala Thr Thr Leu Lys Lys Leu Val Ala Thr Lys Leu Asn Leu Ser
1085 1090 1095 1100

gag gag cag gtg gaa gac tat ttc ttc cag ctc aag agc cag aaa cgt 3603
Glu Glu Gln Val Glu Asp Tyr Phe Phe Gln Leu Lys Ser Gln Lys Arg
1105 1110 1115

tat cat gaa gat atc ttc ggt gca gtc ttt tcc tat ggg gca aaa aag 3651
Tyr His Glu Asp Ile Phe Gly Ala Val Phe Ser Tyr Gly Ala Lys Lys
1120 1125 1130

ggc agc gcc ttg gag gag ccc aaa gcc acg agg ctc tga 3690
Gly Ser Ala Leu Glu Glu Pro Lys Ala Thr Arg Leu
1135 1140 1145

<210> 19

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 19

catcaaaggt ggccgaga

18

<210> 20

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 20

ctgtctagaa ctgcccag

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 21

tgccttgaga acttcggg

18

<210> 22

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 22

tgtcacttat ctggattt

18

<210> 23

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 23

cttgaacaga aatttcca

18

<210> 24

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 24

cttgaacaga aatttcca

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 25

ctgaggttgt gatactga

18

<210> 26

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 26

agcttgacca gagattct

18

<210> 27

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 27

gtgaagtgtg tcttggaa

18

<210> 28

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 28

gcaagatttg gacctgca

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 29

ccctgggtcc tctggtca

18

<210> 30

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 30

gccgtaatat tggttgac

18

<210> 31

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 31

ctcctttggt accgcttc

18

<210> 32

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 32

ctcctttggt accgcttc

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 33

agacctgcag gttggacc

18

<210> 34

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 34

cgtgtctgca gatgtgtt

18

<210> 35

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 35

aagtcgtgct tgccatca

18

<210> 36

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 36

cctctgatgc tgccatct

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 37

atcgaagcgg ccgtactt

18

<210> 38

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 38

tccatggcca cctcaagc

18

<210> 39

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 39

caggcagggc gtaccact

18

<210> 40

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 40

atcgaagcgg ccgtactt

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 41

ctgcccactt cctccagg

18

<210> 42

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 42

ttgatctcaa cgacagcc

18

<210> 43

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 43

tcacatgatgg tcacattc

18

<210> 44

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 44

tcacatgatgg tcacattc

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 45

acgtagttca gcatctcc

18

<210> 46

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 46

gggtctccgc ttctcgtc

18

<210> 47

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 47

agcatacagg caaagagc

18

<210> 48

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 48

tatctctctc gcaaaagc

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 49

ttcctcctcc aggcagct

18

<210> 50

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 50

ccattgccag ggcagtct

18

<210> 51

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 51

acacagcgta cctgaatt

18

<210> 52

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 52

gcttctgata aatgcat

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 53

tgtagtggtg cgggtccc

18

<210> 54

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 54

ctggatgtcg gactttgt

18

<210> 55

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 55

ctcttggtcac tgacccag

18

<210> 56

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 56

ctttaacccc tctctatg

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 57

agttctgtgc cggcagct

18

<210> 58

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 58

acctcagata atgcagag

18

<210> 59

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 59

agatcccgtg ctgacaat

18

<210> 60

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 60

ctgacacacg cctgacaat

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 61

gtccccgccg ccacgaga

18

<210> 62

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 62

actgactgag aatcgctg

18

<210> 63

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 63

ctgctgttcc aggtcaga

18

<210> 64

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 64

attatctcga gattaccc

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 65

cagggttggtgc tcaatgct

18

<210> 66

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 66

caggtaacga aactgatt

18

<210> 67

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 67

attctccaga ggcaggta

18

<210> 68

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 68

tcaatgctt tcaatgctt

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 69

agtccaaagt ttccatct

18

<210> 70

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 70

tttaggattt ctgtcaag

18

<210> 71

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 71

tacatagact ccaccatt

18

<210> 72

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 72

aactaccatt tgttgaca

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 73

tccacatcct gaactacc

18

<210> 74

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 74

ggcaatgatt ttctgtgg

18

<210> 75

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 75

gtccttgcca aagtctgg

18

<210> 76

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 76

atggatctg ccaatgca

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 77

gcctccagca cattctcg

18

<210> 78

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 78

ggtcctgagc agcctcca

18

<210> 79

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 79

ggcaaagcag tctgtgtc

18

<210> 80

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 80

agatgat taa atttatada

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 81

attgtgctcc agttgaaa

18

<210> 82

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 82

tatggacatt tcttgaca

18

<210> 83

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 83

tagggcaggc acgcacac

18

<210> 84

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 84

tttggcaggt tttcttct

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 85

tgatcctgtg ccaatgcc

18

<210> 86

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 86

ctgggtctat ggcttcaa

18

<210> 87

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 87

gacgttcagt ttctctgg

18

<210> 88

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 88

ggataadcaa ggacagac

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 89

actggaactg tagagagg

18

<210> 90

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 90

aggttgctgt tgtcagta

18

<210> 91

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 91

gttaatggta tgataata

18

<210> 92

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 92

ttatctaatg gattctatgc

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 93

ttactattct ctggttga

18

<210> 94

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 94

ctggaacaca gatggttg

18

<210> 95

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 95

caggteccca acagccat

18

<210> 96

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 96

ttactattct ctggttga

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 97

aggttacaag actctatg

18

<210> 98

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 98

tggagccatt ctcaaact

18

<210> 99

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 99

aggccatctt ccatcttc

18

<210> 100

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 100

atggtttatg ggtttatg

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 101

tcagaccac aatgacca

18

<210> 102

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 102

atgctcttcc ttctaaca

18

<210> 103

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 103

ctgtgccact gggagtta

18

<210> 104

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 104

ctgagaccac atgagcca

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 105

gccacaggaa tcttcaca

18

<210> 106

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 106

tggttgggct cagacaca

18

<210> 107

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 107

tccaatgtta tccttgtg

18

<210> 108

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 108

actaagacat tacgggct

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 109

ttctccatca gcattgta

18

<210> 110

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 110

ccaaaggta tcagttcc

18

<210> 111

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 111

catccaacat ttgaccat

18

<210> 112

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 112

atcaggaga caattctt

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 113

gtcatttgga ctgggaag

18

<210> 114

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 114

ttccaaatcc tcttcac

18

<210> 115

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 115

gaggtgggat gttgaaag

18

<210> 116

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 116

gaggaagac tctatctc

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 117

ctcagcagta gcaccctg

18

<210> 118

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 118

tgggtgctac tgtcctct

18

<210> 119

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 119

gtttgtctcg cataggag

18

<210> 120

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 120

ccactgatt caggtatt

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 121

gactcattca catactca

18

<210> 122

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 122

ttgacagtat gttgttct

18

<210> 123

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 123

ttccagtagt cagggttg

18

<210> 124

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 124

tactgaagga tactccda

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 125

aggtattcag gattctct

18

<210> 126

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 126

tctgtaaggt ggaggcgg

18

<210> 127

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 127

agtggtcaaaa ctactggc

18

<210> 128

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 128

attcaggtta ggttggcga

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 129

ctatctttct ctttcagt

18

<210> 130

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 130

atgcagagaa atgaagaa

18

<210> 131

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 131

cagcattgcc ttacattt

18

<210> 132

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 132

atatttcaac catctgct

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 133

tttgttctaa tggaaact

18

<210> 134

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 134

cagagcaaaa caaaatga

18

<210> 135

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 135

aggatgaggg tgaagata

18

<210> 136

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 136

tttgttctaa tggaaact

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 137

gttttcctga accacaga

18

<210> 138

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 138

acatacccaa tccagtgt

18

<210> 139

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 139

aaaatggagt tcagaaaa

18

<210> 140

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 140

gactctcatt atattccc

18

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 141

gagttacctt ctacttca

18

<210> 142

<211> 18

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 142

cacatttatt tacaactt

18

<210> 143

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 143

gtaaaagttgt gaccctggca

20

<210> 144

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 144

ctgagcttct ggtcgaattc

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 145

ttggtaggat ttgactttga

20

<210> 146

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 146

ctcttagggc catcttgat

20

<210> 147

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 147

tcgatgtcac atgcagcttg

20

<210> 148

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 148

tcgatgtcac atgcagcttg

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 149

gggtaggctt gtctctgggt

20

<210> 150

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 150

gcattgaggca ggagctcttc

20

<210> 151

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 151

ttctctccagg ccatcttggt

20

<210> 152

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 152

atgagctctg aattccagag

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 153

cttccagcct aggtcgatgc

20

<210> 154

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 154

atttcaaaga cctctggatc

20

<210> 155

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 155

ctccagtagc atgttggcca

20

<210> 156

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 156

ccatgagggat gggatggtg

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 157

cacattctgc ttctggaaac

20

<210> 158

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 158

ggcccggtac tcattctgca

20

<210> 159

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 159

ggagatagga catagttcaa

20

<210> 160

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 160

ggagatagga catagttcaa

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 161

tctaaatcgg atctctctcc

20

<210> 162

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 162

agtagcaaag aggactgtgg

20

<210> 163

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 163

tgcttggtcac caccagcagt

20

<210> 164

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 164

atctctctctcc

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 165

gctgcggaag gcacccctct

20

<210> 166

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 166

ctggatgagc ctatattgct

20

<210> 167

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 167

tgctgagggc tctgttgagg

20

<210> 168

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 168

gctgcggaag gcacccctct

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 169

gtagctgggc cctcggtgc

20

<210> 170

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 170

gtgtaggaca atccacaact

20

<210> 171

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 171

tgagggcttg gctgagtgag

20

<210> 172

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 172

gtgtaggaca atccacaact

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 173

ctcttcaagg acctccagga

20

<210> 174

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 174

agatagggag ctgcgacagc

20

<210> 175

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 175

catctcgggt gcggtaggtg

20

<210> 176

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 176

acactatgac acttccagga

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 177

gcacccaac accaagctca

20

<210> 178

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 178

agcctgtgtg cacctggaac

20

<210> 179

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 179

ctgaacgtag accttgggtt

20

<210> 180

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 180

acgaatctat tcaatctatg

20

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 181

aagatatctt catgataacg

20

<210> 182

<211> 20

<212> DNA

<213> Artificial Sequence

<223> Antisense Oligonucleotide

<400> 182

agagcctcgt ggctttgggc

20